EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	55784	polyhydroxyalkanoate$ or polyhydroxy alkanoate$ or pha$1	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:30
L2	19301	xylose or xylan	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:30
L3	52	1 same 2	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:31
L4	1920	levulinic acid	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:37
L5	9	1 same 4	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:42
L6	731	1 and 2	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:38
L7	56	6 and hemicellulos$	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:43
L8	61	1 and 4	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:42
L9	4135	2 same carbon	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:42
L10	127	1 and 9	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:42
L11	128	1 and hemicellulos$	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:43
L12	7	10 and 11	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:45
L13	13	8 and (2 or hemicellulos$)	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:44

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	55784	polyhydroxyalkanoate$ or polyhydroxy alkanoate$ or pha$1	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:48
L2	6423	(cosubstrat$ or levulinic or propion$10) near10 (addition$ or second$10 or supplement$)	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:52
L3	195	1 and 2	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:53
L4	28	1 same 2	US-PGPUB; USPAT	ADJ	OFF	2008/01/22 14:54

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* * * * * * * * * * * * * * STN Columbus * * * * * * * * * * * * * * *

FILE 'HOME' ENTERED AT 17:15:26 ON 22 JAN 2008

=> fil .bec
COST IN U.S. DOLLARS                                  SINCE FILE      TOTAL
                                                           ENTRY    SESSION
FULL ESTIMATED COST                                         0.21       0.21

FILES 'MEDLINE, SCISEARCH, LIFESCI, BIOTECHDS, BIOSIS, EMBASE, HCAPLUS, NTIS,
       ESBIOBASE, BIOTECHNO, WPIDS' ENTERED AT 17:15:59 ON 22 JAN 2008
ALL COPYRIGHTS AND RESTRICTIONS APPLY.  SEE HELP USAGETERMS FOR DETAILS.

11 FILES IN THE FILE LIST

=>  s polyhydroxyalkano? or polyhydroxy alkano? or pha#
FILE 'MEDLINE'
            642 POLYHYDROXYALKANO?
            219 POLYHYDROXY
           1181 ALKANO?
              8 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
          16295 PHA#
L1        16444 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'SCISEARCH'
           1517 POLYHYDROXYALKANO?
            707 POLYHYDROXY
           5906 ALKANO?
             21 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
          10560 PHA#
L2        11187 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'LIFESCI'
            562 POLYHYDROXYALKANO?
             79 "POLYHYDROXY"
            437 ALKANO?
              9 POLYHYDROXY ALKANO?
                  ("POLYHYDROXY"(W)ALKANO?)
           6427 PHA#
L3         6563 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'BIOTECHDS'
            867 POLYHYDROXYALKANO?
            158 POLYHYDROXY
            710 ALKANO?
             41 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
            976 PHA#
L4         1392 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'BIOSIS'
           1017 POLYHYDROXYALKANO?
            468 POLYHYDROXY
           2560 ALKANO?
             20 POLYHYDROXY ALKANO?
                  (POLYHYDROXY(W)ALKANO?)
          17692 PHA#
L5        18024 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'EMBASE'
            859 POLYHYDROXYALKANO?
            261 "POLYHYDROXY"
           3658 ALKANO?
```

```
            13 POLYHYDROXY ALKANO?
                 ("POLYHYDROXY"(W)ALKANO?)
         15858 PHA#
L6       16102 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'HCAPLUS'
          2364 POLYHYDROXYALKANO?
          7245 POLYHYDROXY
         38350 ALKANO?
            63 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
         15617 PHA#
L7       16535 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'NTIS'
             5 POLYHYDROXYALKANO?
            54 POLYHYDROXY
           184 ALKANO?
             0 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
           528 PHA#
L8         530 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'ESBIOBASE'
           713 POLYHYDROXYALKANO?
           123 POLYHYDROXY
           700 ALKANO?
            19 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
          4441 PHA#
L9        4607 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'BIOTECHNO'
           527 POLYHYDROXYALKANO?
            45 POLYHYDROXY
           528 ALKANO?
             7 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
          4715 PHA#
L10       4869 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

FILE 'WPIDS'
           569 POLYHYDROXYALKANO?
          6838 POLYHYDROXY
         49126 ALKANO?
           202 POLYHYDROXY ALKANO?
                 (POLYHYDROXY(W)ALKANO?)
          1404 PHA#
L11       1888 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

TOTAL FOR ALL FILES
L12      98141 POLYHYDROXYALKANO? OR POLYHYDROXY ALKANO? OR PHA#

=>  s xylose or xylan or hemicellulos?
FILE 'MEDLINE'
          7443 XYLOSE
          1787 XYLAN
          1266 HEMICELLULOS?
L13       9757 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'SCISEARCH'
          7669 XYLOSE
          2894 XYLAN
          4467 HEMICELLULOS?
L14      13253 XYLOSE OR XYLAN OR HEMICELLULOS?
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FILE 'LIFESCI'
           3245 XYLOSE
           2260 XYLAN
           1050 HEMICELLULOS?
L15        5684 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'BIOTECHDS'
           3432 XYLOSE
           1764 XYLAN
           1290 HEMICELLULOS?
L16        5385 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'BIOSIS'
          12529 XYLOSE
           3459 XYLAN
           5790 HEMICELLULOS?
L17       19703 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'EMBASE'
           5890 XYLOSE
           2857 XYLAN
           1269 HEMICELLULOS?
L18        9018 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'HCAPLUS'
          28498 XYLOSE
           7317 XYLAN
          14790 HEMICELLULOS?
L19       44959 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'NTIS'
            196 XYLOSE
             57 XYLAN
            204 HEMICELLULOS?
L20         379 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'ESBIOBASE'
           3011 XYLOSE
           1367 XYLAN
           1414 HEMICELLULOS?
L21        5025 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'BIOTECHNO'
           2507 XYLOSE
           1961 XYLAN
            849 HEMICELLULOS?
L22        4604 XYLOSE OR XYLAN OR HEMICELLULOS?

FILE 'WPIDS'
           3287 XYLOSE
            723 XYLAN
           1789 HEMICELLULOS?
L23        5427 XYLOSE OR XYLAN OR HEMICELLULOS?

TOTAL FOR ALL FILES
L24      123194 XYLOSE OR XYLAN OR HEMICELLULOS?

=> s l12 and l24
FILE 'MEDLINE'
L25          11 L1 AND L13

FILE 'SCISEARCH'
L26          18 L2 AND L14
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```
FILE 'LIFESCI'
L27            6 L3 AND L15

FILE 'BIOTECHDS'
L28           15 L4 AND L16

FILE 'BIOSIS'
L29           19 L5 AND L17

FILE 'EMBASE'
L30           14 L6 AND L18

FILE 'HCAPLUS'
L31           41 L7 AND L19

FILE 'NTIS'
L32            1 L8 AND L20

FILE 'ESBIOBASE'
L33            6 L9 AND L21

FILE 'BIOTECHNO'
L34            7 L10 AND L22

FILE 'WPIDS'
L35           24 L11 AND L23

TOTAL FOR ALL FILES
L36          162 L12 AND L24

=> s levulinic acid
FILE 'MEDLINE'
            1520 LEVULINIC
         1524685 ACID
L37          360 LEVULINIC ACID
                   (LEVULINIC(W)ACID)

FILE 'SCISEARCH'
             381 LEVULINIC
         1255073 ACID
L38          348 LEVULINIC ACID
                   (LEVULINIC(W)ACID)

FILE 'LIFESCI'
              88 "LEVULINIC"
          339578 "ACID"
L39           85 LEVULINIC ACID
                   ("LEVULINIC"(W)"ACID")

FILE 'BIOTECHDS'
              86 LEVULINIC
          155368 ACID
L40           83 LEVULINIC ACID
                   (LEVULINIC(W)ACID)

FILE 'BIOSIS'
            2455 LEVULINIC
         1511945 ACID
L41         2418 LEVULINIC ACID
                   (LEVULINIC(W)ACID)

FILE 'EMBASE'
             389 "LEVULINIC"
         1536009 "ACID"
L42          382 LEVULINIC ACID
```

```
                  ("LEVULINIC"(W)"ACID")

FILE 'HCAPLUS'
           4247 LEVULINIC
        4515363 ACID
L43        3985 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

FILE 'NTIS'
             17 LEVULINIC
          45122 ACID
L44          15 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

FILE 'ESBIOBASE'
             99 LEVULINIC
         395980 ACID
L45          92 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

FILE 'BIOTECHNO'
             85 LEVULINIC
         349810 ACID
L46          85 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

FILE 'WPIDS'
            507 LEVULINIC
        1126145 ACID
L47         474 LEVULINIC ACID
                  (LEVULINIC(W)ACID)

TOTAL FOR ALL FILES
L48        8327 LEVULINIC ACID

=> s l12 and l48
FILE 'MEDLINE'
L49             5 L1 AND L37

FILE 'SCISEARCH'
L50            11 L2 AND L38

FILE 'LIFESCI'
L51             4 L3 AND L39

FILE 'BIOTECHDS'
L52             7 L4 AND L40

FILE 'BIOSIS'
L53             7 L5 AND L41

FILE 'EMBASE'
L54             4 L6 AND L42

FILE 'HCAPLUS'
L55            22 L7 AND L43

FILE 'NTIS'
L56             0 L8 AND L44

FILE 'ESBIOBASE'
L57             6 L9 AND L45

FILE 'BIOTECHNO'
L58             4 L10 AND L46
```

```
FILE 'WPIDS'
L59            4 L11 AND L47

TOTAL FOR ALL FILES
L60           74 L12 AND L48

=> s (l36 or l60) not 2004-2008/py
FILE 'MEDLINE'
       2611376 2004-2008/PY
                 (20040000-20089999/PY)
L61           10 (L25 OR L49) NOT 2004-2008/PY

FILE 'SCISEARCH'
       4755321 2004-2008/PY
                 (20040000-20089999/PY)
L62           16 (L26 OR L50) NOT 2004-2008/PY

FILE 'LIFESCI'
        551380 2004-2008/PY
L63            7 (L27 OR L51) NOT 2004-2008/PY

FILE 'BIOTECHDS'
        107093 2004-2008/PY
L64           14 (L28 OR L52) NOT 2004-2008/PY

FILE 'BIOSIS'
       2218323 2004-2008/PY
L65           17 (L29 OR L53) NOT 2004-2008/PY

FILE 'EMBASE'
       2284106 2004-2008/PY
L66           12 (L30 OR L54) NOT 2004-2008/PY

FILE 'HCAPLUS'
       5230844 2004-2008/PY
L67           35 (L31 OR L55) NOT 2004-2008/PY

FILE 'NTIS'
         63576 2004-2008/PY
L68            1 (L32 OR L56) NOT 2004-2008/PY

FILE 'ESBIOBASE'
       1335729 2004-2008/PY
L69            7 (L33 OR L57) NOT 2004-2008/PY

FILE 'BIOTECHNO'
           586 2004-2008/PY
L70           11 (L34 OR L58) NOT 2004-2008/PY

FILE 'WPIDS'
       4428145 2004-2008/PY
L71            4 (L35 OR L59) NOT 2004-2008/PY

TOTAL FOR ALL FILES
L72          134 (L36 OR L60) NOT 2004-2008/PY

=> s (cosubstrat? or levulinic or propion?)(10a)(addition? or second? or
supplement?)
FILE 'MEDLINE'
          1002 COSUBSTRAT?
          1520 LEVULINIC
         31143 PROPION?
       1082136 ADDITION?
        875213 SECOND?
```

```
        137597 SUPPLEMENT?
L73        788 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                OR SUPPLEMENT?)

FILE 'SCISEARCH'
           941 COSUBSTRAT?
           381 LEVULINIC
         27574 PROPION?
       1289212 ADDITION?
        914600 SECOND?
        151669 SUPPLEMENT?
L74        932 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                OR SUPPLEMENT?)

FILE 'LIFESCI'
           473 COSUBSTRAT?
            88 LEVULINIC
          9542 PROPION?
        318824 ADDITION?
        183094 SECOND?
         30379 SUPPLEMENT?
L75        398 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                OR SUPPLEMENT?)

FILE 'BIOTECHDS'
           277 COSUBSTRAT?
            86 LEVULINIC
          2827 PROPION?
         49010 ADDITION?
         38291 SECOND?
         17177 SUPPLEMENT?
L76        205 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                OR SUPPLEMENT?)

FILE 'BIOSIS'
          1251 COSUBSTRAT?
          2455 LEVULINIC
         43483 PROPION?
       1117539 ADDITION?
        698686 SECOND?
        206304 SUPPLEMENT?
L77       1361 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                OR SUPPLEMENT?)

FILE 'EMBASE'
           931 COSUBSTRAT?
           389 LEVULINIC
         37413 PROPION?
       1014011 ADDITION?
        694664 SECOND?
        129843 SUPPLEMENT?
L78        675 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                OR SUPPLEMENT?)

FILE 'HCAPLUS'
          1902 COSUBSTRAT?
          4247 LEVULINIC
        141191 PROPION?
        221462 ADDITION?
       1642205 ADDN
        536957 ADDNL
       2253934 ADDITION?
                  (ADDITION? OR ADDN OR ADDNL)
       1155353 SECOND?
        186836 SUPPLEMENT?
```

```
L79        3489 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                 OR SUPPLEMENT?)

FILE 'NTIS'
                9 COSUBSTRAT?
               17 LEVULINIC
              540 PROPION?
           178735 ADDITION?
           144720 SECOND?
            28998 SUPPLEMENT?
L80            18 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                 OR SUPPLEMENT?)

FILE 'ESBIOBASE'
              594 COSUBSTRAT?
               99 LEVULINIC
             8702 PROPION?
           464980 ADDITION?
           297457 SECOND?
            52832 SUPPLEMENT?
L81           497 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                 OR SUPPLEMENT?)

FILE 'BIOTECHNO'
              457 COSUBSTRAT?
               85 LEVULINIC
             6189 PROPION?
           241683 ADDITION?
           116613 SECOND?
            18671 SUPPLEMENT?
L82           309 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                 OR SUPPLEMENT?)

FILE 'WPIDS'
               47 COSUBSTRAT?
              507 LEVULINIC
            40324 PROPION?
           656227 ADDITION?
           137167 ADDN
           780342 ADDITION?
                    (ADDITION? OR ADDN)
          1635096 SECOND?
           109357 SEC
          1727438 SECOND?
                    (SECOND? OR SEC)
            72102 SUPPLEMENT?
L83           811 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                 OR SUPPLEMENT?)

TOTAL FOR ALL FILES
L84          9483 (COSUBSTRAT? OR LEVULINIC OR PROPION?)(10A)(ADDITION? OR SECOND?
                 OR SUPPLEMENT?)

=> s l12 and l84
FILE 'MEDLINE'
L85             6 L1 AND L73

FILE 'SCISEARCH'
L86            17 L2 AND L74

FILE 'LIFESCI'
L87            11 L3 AND L75

FILE 'BIOTECHDS'
L88             8 L4 AND L76
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FILE 'BIOSIS'
L89            9 L5 AND L77

FILE 'EMBASE'
L90            7 L6 AND L78

FILE 'HCAPLUS'
L91           20 L7 AND L79

FILE 'NTIS'
L92            1 L8 AND L80

FILE 'ESBIOBASE'
L93           12 L9 AND L81

FILE 'BIOTECHNO'
L94           10 L10 AND L82

FILE 'WPIDS'
L95            4 L11 AND L83

TOTAL FOR ALL FILES
L96          105 L12 AND L84

=> s l96 not 2004-2008/py
FILE 'MEDLINE'
       2611376 2004-2008/PY
                 (20040000-20089999/PY)
L97            5 L85 NOT 2004-2008/PY

FILE 'SCISEARCH'
       4755321 2004-2008/PY
                 (20040000-20089999/PY)
L98           14 L86 NOT 2004-2008/PY

FILE 'LIFESCI'
        551380 2004-2008/PY
L99           10 L87 NOT 2004-2008/PY

FILE 'BIOTECHDS'
        107093 2004-2008/PY
L100           7 L88 NOT 2004-2008/PY

FILE 'BIOSIS'
       2218323 2004-2008/PY
L101           7 L89 NOT 2004-2008/PY

FILE 'EMBASE'
       2284106 2004-2008/PY
L102           7 L90 NOT 2004-2008/PY

FILE 'HCAPLUS'
       5230844 2004-2008/PY
L103          16 L91 NOT 2004-2008/PY

FILE 'NTIS'
         63576 2004-2008/PY
L104           1 L92 NOT 2004-2008/PY

FILE 'ESBIOBASE'
       1335729 2004-2008/PY
L105          10 L93 NOT 2004-2008/PY

FILE 'BIOTECHNO'
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          586 2004-2008/PY
L106         10 L94 NOT 2004-2008/PY

FILE 'WPIDS'
      4428145 2004-2008/PY
L107          1 L95 NOT 2004-2008/PY

TOTAL FOR ALL FILES
L108         88 L96 NOT 2004-2008/PY

=> dup rem l108
PROCESSING COMPLETED FOR L108
L109          23 DUP REM L108 (65 DUPLICATES REMOVED)

=> d tot

L109 ANSWER 1 OF 23    MEDLINE on STN                    DUPLICATE 1
TI   Production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) with high molar
     fractions of 3-hydroxyvalerate by a threonine-overproducing mutant of
     Alcaligenes sp. SH-69.
SO   Biotechnology letters, (2003 May) Vol. 25, No. 9, pp. 665-70.
     Journal code: 8008051. ISSN: 0141-5492.
AU   Choi Gang Guk; Kim Moo Woong; Kim Jeong-Yoon; Rhee Young Ha
AN   2003350281     MEDLINE

L109 ANSWER 2 OF 23  SCISEARCH  COPYRIGHT (c) 2008 The Thomson Corporation on
     STN                                                 DUPLICATE 2
TI   Microbial production of poly(hydroxyalkanoate)s from waste edible oils
SO   GREEN CHEMISTRY, (FAL-WIN 2003) Vol. 5, No. 5, pp. 545-548.
     ISSN: 1463-9262.
AU   Taniguchi I (Reprint); Kagotani K; Kimura Y
AN   2003:1028040  SCISEARCH

L109 ANSWER 3 OF 23  HCAPLUS  COPYRIGHT 2008 ACS on STN
TI   Production of polyhydroxyalkanoates by a mixed culture in a
     sequencing batch reactor: the use of propionate as carbon source
SO   Mededelingen - Faculteit Landbouwkundige en Toegepaste Biologische
     Wetenschappen (Universiteit Gent) (2003), 68(2a), 109-114
     CODEN: MFLBER; ISSN: 1373-7503
AU   Lemos, P. C.; Serafim, L. S.; Santos, H.; Reis, M. A. M.
AN   2003:920144  HCAPLUS
DN   140:216241

L109 ANSWER 4 OF 23    MEDLINE on STN                    DUPLICATE 3
TI   Effects of culture conditions on the production of
     polyhydroxyalkanoates by Azotobacter chroococcum H23 in media
     containing a high concentration of alpechin (wastewater from olive oil
     mills) as primary carbon source.
SO   Journal of biotechnology, (2002 Aug 7) Vol. 97, No. 2, pp. 125-31.
     Journal code: 8411927. ISSN: 0168-1656.
AU   Pozo C; Martinez-Toledo M V; Rodelas B; Gonzalez-Lopez J
AN   2002325377     MEDLINE

L109 ANSWER 5 OF 23    MEDLINE on STN                    DUPLICATE 4
TI   Utilization of swine wastewater as a feedstock for the production of
     polyhydroxyalkanoates by Azotobacter vinelandii UWD.
SO   Journal of bioscience and bioengineering, (2001) Vol. 91, No. 2, pp.
     129-33.
     Journal code: 100888800. ISSN: 1389-1723.
AU   Cho K; Ryu H W; Park C; Goodrich P R
AN   2005557272     MEDLINE

L109 ANSWER 6 OF 23  SCISEARCH  COPYRIGHT (c) 2008 The Thomson Corporation  on
     STN
TI   Feeding strategy of propionic acid for production of poly(3-
```

hydroxybutyrate-co-3-hydroxyvalerate) with Ralstonia eutropha
SO BIOCHEMICAL ENGINEERING JOURNAL, (SEP 2001) Vol. 8, No. 2, pp. 103-110.
ISSN: 1369-703X.
AU Du G C C; Chen J; Yu J (Reprint); Lun S Y
AN 2001:618525 SCISEARCH

L109 ANSWER 7 OF 23 LIFESCI COPYRIGHT 2008 CSA on STN DUPLICATE 5
TI A metabolic model for acetate uptake under anaerobic conditions by glycogen accumulating organisms: Stoichiometry, kinetics, and the effect of pH
SO Biotechnology and Bioengineering [Biotechnol. Bioeng.], (20010000) vol. 76, no. 1, pp. 17-31.
ISSN: 0006-3592.
AU Filipe, C.D.M.; Daigger, G.T.; Grady, C.P.L.,Jr.
AN 2002:11717 LIFESCI

L109 ANSWER 8 OF 23 MEDLINE on STN DUPLICATE 6
TI Characterization, seasonal occurrence, and diel fluctuation of poly(hydroxyalkanoate) in photosynthetic microbial mats.
SO Applied and environmental microbiology, (2000 Oct) Vol. 66, No. 10, pp. 4279-91.
Journal code: 7605801. ISSN: 0099-2240.
AU Rothermich M M; Guerrero R; Lenz R W; Goodwin S
AN 2001032730 MEDLINE

L109 ANSWER 9 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on STN DUPLICATE 7
TI Oleic acid improves poly(3-hydroxybutyrate-co-3-hydroxyvalerate) production by Ralstonia eutropha in inverted sugar and propionic acid
SO BIOTECHNOLOGY LETTERS, (OCT 2000) Vol. 22, No. 20, pp. 1635-1638.
ISSN: 0141-5492.
AU Marangoni C; Furigo A; de Aragao G M F (Reprint)
AN 2000:793886 SCISEARCH

L109 ANSWER 10 OF 23 MEDLINE on STN DUPLICATE 8
TI Sequence of PHA synthase gene from two strains of Rhodospirillum rubrum and in vivo substrate specificity of four PHA synthases across two heterologous expression systems.
SO Applied microbiology and biotechnology, (2000 Apr) Vol. 53, No. 4, pp. 420-9.
Journal code: 8406612. ISSN: 0175-7598.
AU Clemente T; Shah D; Tran M; Stark D; Padgette S; Dennis D; Bruckener K; Steinbuchel A; Mitsky T
AN 2000261043 MEDLINE

L109 ANSWER 11 OF 23 BIOTECHDS COPYRIGHT 2008 THE THOMSON CORP. on STN
TI Regulating the molar fraction of 4-hydroxybutyrate in poly(3-hydroxybutyrate-4-hydroxybutyrate) biosynthesis by Ralstonia eutropha using propionate as a stimulator;
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            SZ UG
         W: AL AM AT AU AZ BB BG BR BY CA CH CN CZ DE DK EE ES FI GB GE HU IS
            JP KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT
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L109 ANSWER 20 OF 23 HCAPLUS COPYRIGHT 2008 ACS on STN
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OREF 44:9914e-i,9915a-b

=> d ab tot

L109 ANSWER 1 OF 23 MEDLINE on STN DUPLICATE 1
AB A threonine overproducing mutant of Alcaligenes sp. SH-69 was isolated and its ability to produce poly(3-hydroxybutyrate-co-3-hydroxyvalerate), poly(3HB-co-3HV), was investigated. The 3HV fraction in poly(3HB-co-3HV) produced from glucose as the sole carbon source exceeded 22 mol%, which is approximately six times higher than that achieved by the wild type under the same culture conditions. Furthermore, the addition of a relatively low concentration (10 mM) of propionic acid, valeric acid or levulinic acid to the glucose medium greatly increased the molar fraction of 3HV in the copolyester, to 38-77 mol%. The results suggest that metabolic engineering of the biosynthetic pathways supplying polyhydroxyalkanoate monomers, such as the threonine biosynthetic pathway, can lead to new poly(3HB-co-3HV)-producing strains.

L109 ANSWER 2 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on

STN DUPLICATE 2

AB The biosynthesis of poly(3-hydroxyalkanoate) (PHA) from waste edible oils and tallow by Ralstonia eutropha was investigated. Waste plant oils as well as waste tallow were assimilated-And successfully converted to PHA with relatively high yield by the bacterial fermentation. The waste plant oils usually gave poly(3-hydroxybutyrate) (PHB) while waste tallow gave poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV). The ratio of 3-hydroxyvalerate (3HV) unit in the copolyester was controlled by the addition of sodium propionate to the cultivation medium containing waste plant oils as' carbon sources. The ratio of PHA Accumulated was also quite high and up to 80% of the cell dry weight. The PHA accumulated was easily isolated by simply mixing the cells in aqueous sodium hypochlorite without using any organic solvents. We propose herein the biorecycling of waste oils as renewable resources for sustainable society.

L109 ANSWER 3 OF 23 HCAPLUS COPYRIGHT 2008 ACS on STN

AB In this work, sludge adapted to anaerobic/aerobic conditions, AN/AE, showing a high capacity of P accumulation, was submitted to aerobic dynamic substrate feeding (ADF). The fermenter was operated as a Sequencing Batch Reactor, with propionate as carbon substrate. Propionate is an important waste product from several industrial processes that can be valued, using it as a precursor for hydroxyvalerate in PHA production Under the operational conditions used, apart from 3-hydroxyvalerate as its major component, 3-hydroxy-2-methylvalerate, 2-hydroxyisovalerate and 4-oxovalerate were also produced. A second reactor operated under the same conditions was adapted for the use of acetate as carbon substrate. The global metabolism of the organisms involved on PHA production, utilizing acetate or propionate, was studied using in vivo 13C NMR.

L109 ANSWER 4 OF 23 MEDLINE on STN DUPLICATE 3

AB Large amounts of homopolymers containing beta-hydroxybutyrate (PHB) and copolymers containing beta-hydroxyvalerate (P[HB-co-HV]) are produced by Azotobacter chroococcum strain H23 when growing in culture media amended with alpechin (wastewater from olive oil mills) as the sole carbon source. Copolymer was formed when valerate (pentanoate) was added as a precursor to the alpechin medium, but it was not formed with the addition of propionate as a precursor. A. chroococcum formed homo- and copolymers of polyhydroxyalkanoates (PHAs) up to 80% of the cell dry weight, when grown on NH(4)(+)-medium supplemented with 60% (v/v) alpechin, after 48 h of incubation at 100 rev min(-1) and 30 degrees C. Production of PHAs by strain H23 using alpechin looks promising, as the use of a cheap substrate for the production of these materials is essential if bioplastics are to become competitive products.

L109 ANSWER 5 OF 23 MEDLINE on STN DUPLICATE 4

AB Azotobacter vinelandii UWD produced 0.69 g.l(-1) poly(hydroxybutyrate-co-hydroxyvalerate, PHBV) with 7.9 mol% hydroxyvalerate (HV) from twofold-diluted swine wastewater (SW). When supplemented with 20 g.l(-1) glucose, twofold-diluted SW increased copolymer production by 8.6 times. When three organic acids (acetate, propionate and butyrate) present in SW were supplemented with 20 g.l(-1) glucose, PHBV production was comparable (5.5 g.l(-1)) to that in the case of using twofold-diluted SW supplemented with 20 g.l(-1) glucose. However, the HV level (1.1-1.3 mol%) was very low. The component in SW contributing to copolymer production was found to be valerate. By 20 mM valerate 0.2 g.l(-1) PHBV with 44.6 mol% HV was produced. With 30 g.l(-1) glucose supplementation, 4.0 g.l(-1) PHBV with 22 mol% HV was produced. The optimal ratios of carbon to phosphorus (C : P) and to nitrogen (C : N) were 165 : 1 and 22 : 1, respectively.

L109 ANSWER 6 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on STN

AB The effects of propionic acid feeding strategy on production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) [P(3HB-co-3HV)] were studied with Ralstonia eutropha. Flask culture revealed that the time and concentration of propionic acid addition had significant effects on cell growth, P(3HB-co-3HV) synthesis, and HV fraction in the copolymer. In fed-batch culture, a low ratio of propionic acid to glucose (P/G) led to high dry cell weight (DCW), P(3HB-co-3HV) content and productivity, but low HV unit fraction. A high P/G ratio led to, on the other hand, high HV unit fraction but the low P(3HB-co-3HV) content and productivity. The specific P(3HB-co-3HV) synthetic rate and the specific HV synthetic rate declined in fed-batch cultures, which deteriorated with high P/G feeding due to the inhibitory effect of propionic acid accumulated in the culture broth. According to the non-steady state synthesis of P(3HB-co-3HV) by R. eutropha, an optimal feeding strategy to control the propionic acid accumulation was developed and demonstrated. The propionic acid feeding rate was reduced with time, and DCW, P(3HB-co-3HV) concentration, P(3HB-co-3HV) content and RV fraction in P(3HB-co-3HV) reached 52.1 gl(-1), 40.8 gl(-1), 78.3% and 16.2 mol%, respectively. P(3HB-co-3HV) productivity was 0.74 gl(-1) h(-1).

L109 ANSWER 7 OF 23 LIFESCI DUPLICATE 5

AB A metabolic model for the stoichiometry of acetate uptake under anaerobic conditions by an enriched culture of glycogen accumulating organisms (GAOs) was developed and tested by experimental studies. Glycogen served as the source of both reducing power and energy to drive the process of acetate uptake. The amount of glycogen consumed and poly- beta -hydroxyvalerate (PHV) accumulated in the cells increased with increasing pH, indicating that the energy requirements for acetate uptake increased with pH. The composition of the accumulated poly- beta -hydroxyalkanoates (PHAs) was adequately predicted using the assumption that acetyl-CoA and propionyl-CoA condense randomly to produce PHA. In addition, the rate of acetate uptake was strongly affected by the pH. The rate decreased with increasing pH and this dependence could be described with a saturation type of expression. A comparison of the rate of acetate uptake at low pH with the rates observed in enriched cultures of phosphorus accumulating organisms (PAOs) indicated that GAOs are able to compete effectively with PAOs in nutrient removal systems under certain conditions.

L109 ANSWER 8 OF 23 MEDLINE on STN DUPLICATE 6

AB In situ poly(hydroxyalkanoate) (PHA) levels and repeating-unit compositions were examined in stratified photosynthetic microbial mats from Great Sippewissett Salt Marsh, Mass., and Ebro Delta, Spain. Unlike what has been observed in pure cultures of phototrophic bacteria, the prevalence of hydroxyvalerate (HV) repeating units relative to hydroxybutyrate (HB) repeating units was striking. In the cyanobacteria-dominated green material of Sippewissett mats, the mole percent ratio of repeating units was generally 1HB:1HV. In the purple sulfur bacteria-dominated pink material the relationship was typically 1HB:2HV. In Sippewissett mats, PHA contributed about 0.5 to 1% of the organic carbon in the green layer and up to 6% in the pink layer. In Ebro Delta mats, PHA of approximately 1HB:2HV-repeating-unit distribution contributed about 2% of the organic carbon of the composite photosynthetic layers (the green and pink layers were not separated). Great Sippewissett Salt Marsh mats were utilized for more extensive investigation of seasonal, diel, and exogenous carbon effects. When the total PHA content was normalized to organic carbon, there was little seasonal variation in PHA levels. However, routine daily variation was evident at all sites and seasons. In every case, PHA levels increased during the night and decreased during the day. This phenomenon was conspicuous in the pink layer, where PHA levels doubled overnight. The daytime declines could be inhibited by artificial shading. Addition of exogenous acetate, lactate, and propionate induced two- to fivefold increases in the total

PHA levels when applied in the daylight but had no effect when applied at night. The distinct diel pattern of in situ PHA accumulation at night appears to be related, in some phototrophs, to routine dark energy metabolism and is not influenced by the availability of organic nutrients.

L109 ANSWER 9 OF 23 SCISEARCH on STN DUPLICATE 7

AB With the objective of verifying the influence of oleic acid as a nutritional supplement in the production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) by Ralstonia eutropha, cultures were established with 0.3 g oleic acid l(-1) and without this supplement, in 30 g inverted sugar l(-1) and 1 g propionic acid l(-1). The use of this supplement increased the accumulation of polymer from 18.3% to 28.3% (w/w) although the mass of 3-hydroxyvalerate in the polymer remained constant for both cultures.

L109 ANSWER 10 OF 23 MEDLINE on STN DUPLICATE 8

AB A 3.0-kb genomic fragment has been isolated from Rhodospirillum rubrum (ATCC 25903) that contains an open reading frame (ORF) with strong homology to other known polyhydroxyalkanoate (PHA) synthase genes. This ORF has lower homology to the R. rubrum strain Ha PHA synthase than would be expected within the same species. We have conducted a series of heterologous expression studies evaluating the in vivo substrate specificity of PHA synthase genes from Rhodobacter sphaeroides, Ralstonia eutropha (formerly Alcaligenes eutrophus), Thiocystis violacea, and Nocardia corrallina, within the PHA-synthase-negative hosts, Ralstonia eutropha DSM541 and Pseudomonas putida GpP104. The N. corrallina PHA synthase incorporated the highest percentage of C5 monomers in the polymer when fermented in medium supplemented with 0.1% heptanoate as the sole carbon source. When the T. violacea and R. sphaeroides were expressed in the PHA-negative host DSM541, a greater percentage of C5 monomer was observed in the polymer as compared to the expression of the PHA synthase of R. eutropha, when the transconjugants were fermented in medium supplemented with 0.4% propionate. Evaluation for preference of medium-chain-length monomers demonstrated the flexibility of the N. corrallina, T. violacea, and R. eutropha synthase genes to polymerize a copolyester composed of short- and medium-chain-length monomers when the respective transconjugants were fermented in medium supplemented with 0.5% octanoate. These studies demonstrate that the PHA synthase from N. corrallina, T. violacea, and R. eutropha are able to polymerize a copolyester composed of short- and medium-chain-length monomers, while the PHA synthase from R. sphaeroides lacks this ability and only produces a short-chain-length polymer. These observations suggest that the composition of the PHA from the PHA-producing organisms does not necessarily reflect the inherent specificity of the PHA synthase.

L109 ANSWER 11 OF 23 BIOTECHDS on STN

AB The regulation of the molar fraction of 4-hydroxybutyrate (4-HB) in poly(3-hydroxybutyrate-4-hydroxybutyrate) (P(3HB-4HB)) biosynthesis by Ralstonia eutropha was attempted by the supplemental addition of propionic acid. The molar fraction of 4-HB in P(3HB-4HB) was increased from 12.3 to 51.8 mol% by the addition of a small amount of propionate along with gamma-butyrolactone, which is commonly used as a precursor for the biosynthesis of P(3HB-4HB). The mechanism of regulation by propionate was examined by measuring the variation of enzyme activities related to the biosynthesis of the copolymer and the level of acetyl-CoA, an intermediate metabolite. Poly-beta-hydroxybutyrate-synthase activity was induced by propionate, and the acetyl-CoA concentration also increased. The overflowing acetyl-CoA appeared to cause an inhibitory effect on the ketolysis reaction catalyzing the lysis of 4-hydroxybutyryl-CoA to 2

molecules of acetyl-CoA, so that the 4-HB fraction available for polymerization increased. Thus, the molar fraction of 4-HB in P(3HB-4HB) was regulated by increased 4-HB fraction and an activated PHB-synthase when propionate was used as a stimulator. (14 ref)

L109 ANSWER 12 OF 23 BIOTECHDS COPYRIGHT 2008 THE THOMSON CORP. on STN

AB A new method for waste-water treatment involve bio-flocculation and produces a microbial polyester as a product. After the waste is treated it is put into a fermentor, where nitrogen is introduced and is maintained for a certain period of time to give propagatable bacteria. A micro quantity of conditioning agent is added to regulate the pH to 7-8 and a microquantity of oxygen is added to encourage microaerophilic culture for a certain period of time and then aerobic culture for a certain period of time. Sodium acetate or sodium propionate and glucose are added together with continuous addition of compressed air to aid the aerobic culture. The poly-beta-hydroxyalkanoate formed is extracted from the culture. The method is simple and the operation is convenient, low cost and easily scaled-up.

L109 ANSWER 13 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on STN DUPLICATE 9

AB Polyhydroxyalkanoates (PHAs) are a class of carbon and energy storage polymers produced by numerous bacteria in response to environmental limitation. The type of polymer produced depends on the carbon sources available, the flexibility of the organism's intermediary metabolism, and the substrate specificity of the PHA biosynthetic enzymes, Ralstonia eutropha produces both the homopolymer poly-beta-hydroxybutyrate (PHB) and, when provided with the appropriate substrate, the copolymer poly(beta-hydroxybutyrate-co-beta-hydroxyvalerate) (PHBV). A required step in production of the hydroxyalerate moiety of PHBV is the condensation of acetyl coenzyme A (acetyl-CoA) and propionyl-CoA to form beta-ketovaleryl-CoA. This activity has generally been attributed to the beta-ketothiolase encoded by R. eutropha phbA. However, we have determined that PhbA does not significantly contribute to catalyzing this condensation reaction. Here we report the cloning and genetic analysis of bktB, which encodes a beta-ketothiolase from R. eutropha that is capable of forming beta-ketovaleryl-CoA. Genetic analyses determined that BktB is the primary condensation enzyme leading to production of beta-hydroxyvalerate derived from propionyl-CoA, We also report an additional beta-ketothiolase, designated BMC, that probably serves as a secondary route toward beta-hydroxyvalerate production.

L109 ANSWER 14 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on STN DUPLICATE 10

AB Azotobacter salinestris, a sodium-dependent. microaerophilic N-2-fixing soil bacterium, formed polyhydroxyalkanoate copolymers comprised of beta-hydroxybutyric acid and 9-12 mol% beta-hydroxyvaleric acid (HV) during growth on sugars. Increased HV content was achieved by feeding valeric acid to the culture growing on glucose, but propionic acid could be directed to HV formation only when it served as the sole C source. Polymer production in nitrogen-fixing cells was increased at higher aeration, provided that a complex organic nitrogen source was also present, but there was no HV in the polymer. HV production was increased to 28 mol% in nitrogen-fixing cells when aeration was lower and acetate was provided with glucose in the medium. Enzymes leading to the production of polyhydroxyalkanoate copolymers were found to be similar in A. salinestris and Azotobacter vinelandii, but A. vinelandii is unable to form HV from propionate or from sugars without valeric acid addition. A biochemical scheme is proposed for the production of HV in A. salinestris, whereby the glyoxylate bypass assimilates acetate to generate succinate, which may be converted into propionyl-CoA for HV synthesis. The results suggest that it may be possible to control the molar yield of HV formed from sugars by A. salinestris.

L109 ANSWER 15 OF 23 WPIDS COPYRIGHT 2008 THE THOMSON CORP on STN

AB WO 1996025509 A1 UPAB: 20050513

Poly-3-hydroxyalkanoate (PHA) is produced from at least one aliphatic carboxylic acid or hydrolysable derivative thereof (A) that has low solubility in water, by (a) providing a nutrient medium containing assimilable cpds. of phosphorus in amount corresponding to the requirement of the bacterial cells to be grown, and of nitrogen, sulphur, and trace elements; (b) inoculating with cells of Alcaligenes; (c) providing assimilable carbon (B) in amount corresponding to the quantity of cells to be grown; (d) aerobically fermenting while monitoring pH and adjusting by addition of ammonia and/or alkali metal cpds., until cell growth stops or slows substantially; then (e) aerobically fermenting by feeding (A) while monitoring pH and adjusting as before, until a design quantity of PHA has been produced; and (f) recovering the PHA.

USE - Recovered PHA is of use in melt-processing or solvent processing, or as a latex for use as coating or adhesive.

ADVANTAGE - PHA is provided in high yield and/or output rate. Any species or strain of Alcaligenes may be used.

L109 ANSWER 16 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on STN

AB The preparation of novel fluorinated poly(beta-hydroxyalkanoates), PHAs, was carried out using Pseudomonas oleovorans (ATCC 29347) and Pseudomonas putida (KT 2442) as biocatalysts. These organisms were first grown on 40 mM sodium citrate prior to studying polymer formation in the second stage using 1:1 molar mixtures of nonanoic acid (NA) and fluorinated acid cosubstrates. The following fluoro acids were synthesized and used in this study: 6,6,6-trifluorohexanoic acid (TFHxA), 6,6,7,7,8,8,8-heptafluorooctanoic acid (HpFOA), 6,6,7,7,8,8,9,9,9-nonafluorononanoic acid (INFNA), and 6,6,7,7,8,8,9,9, 10,10,11,11,11-tridecafluoroundecanoic acid (TDFUDA). In general, the use of NA/fluoro acid cosubstrate mixtures instead of only NA in second -stage cultivations resulted in little to no cellular toxicity as measured by values of colony-forming units per milliliter. The mol percent incorporations of fluorinated side chains was determined by H-1 and F-19 NMR spectroscopies, and peak assignments were made using two-dimensional reverse-detected heteronuclear multiplet quantum correlation (HMQC) as well as H-1-H-1 correlation spectroscopy (COSY). P. putida formed PHA after a 3-day second-stage cultivation time with 17.3 mol % fluorinated side chains using NA/NFNA as cosubstrates. For shorter second-stage cultivation times (1 day) where product yields were relatively higher, 0.3 g/L of product was formed that contained 6.4 mol % fluoroalkanoate side groups using P. oleovorans as the biocatalyst and NA/HpFOA as cosubstrates. The incorporation of 12.4 mol % fluoroalkanoate repeat units resulted in products which showed melting at higher temperatures (55-80 degrees C), crystallized at faster rates from the melt, and had higher heats of fusion. Investigation of the surface free energy of products by surface contact angle measurements showed only a modest increase from 87 to 94 degrees for PHAs containing 0 and 17.3 mol % fluorinated side chains.

L109 ANSWER 17 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on STN DUPLICATE 11

AB Following growth of Alcaligenes sp. SH-69 on glucose as a sole carbon source for the production of poly-beta-hydroxyalkanoates (PHAs), relatively low levels of levulinic acid (LA) were detected. Experiments were carried out in batch and continuous culture, and the effects of LA addition on growth and PHA synthesis were determined. Significant stimulatory effects were observed, greater than those for propionic acid addition. In N-limited two stage continuous culture, a maximal PHA content of 38.3% (w/w) was achieved with a polyhydroxyvalerate (PHV) content of 23.5% (molar basis) at D=0.078 1/h. This resulted from, the controlled addition of LA at 0.5 g/L/h in the presence of excess glucose.

L109 ANSWER 18 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on STN DUPLICATE 12

AB Synthesis and accumulation of poly-beta-hydroxyalkanoate (PHA) in Bacillus thuringiensis R-510 isolated from soil were investigated. This organism was resistant to relatively high concentration of propionate and had a capability of accumulating copolymers consisting of 3-hydroxybutyrate (3HB) and 3-hydroxyvalerate (3HV) when the medium was supplemented with propionate as a precursor. The PHA content maximally reached up to 44.5% of dry cell weight in the presence of 0.1% propionate. The molar fraction of 3HV in the copolymer was increased from 19.4 to 80.2 mol% by adding 0.05 to 0.5% propionate to glucose medium, The addition of propionate during exponential or stationary phase of cell growth was less effective for the enhancement of 3HV content in the copolymer, although cell mass and PHA content were not affected by the time of propionate addition, PHB homopolymer and copolymer produced by B. thuringiensis R-510 were measured to have number average molecular weights in the range of 53,000 to 65,000. Polydispersity indices were between 1.5 and 2.2, Some of the produced polymers had bimodal molecular weight distributions.

L109 ANSWER 19 OF 23 SCISEARCH COPYRIGHT (c) 2008 The Thomson Corporation on STN DUPLICATE 13

AB Enhanced biological phosphorus removal by anaerobic-aerobic operation is not always achieved successfully. In this study, microbial metabolism in the activated sludge of a failed enhanced biological phosphorus removal process was investigated to clarify the cause of the failure. The dominant microorganisms in the sludge consumed carbohydrates in the uptake process of acetate or propionate under anaerobic conditions and accumulated polyhydroxyalkanaate. But significant release of phosphate was not observed because polyphosphate was not utilized. Consumed carbohydrates were found to have been converted to polyhydroxyalkanoate via propionyl-CoA in addition to acetyl-CoA, indicating that the microorganisms had enzymes to convert phosphoenolpyruvate or pyruvate produced in glycolysis to propionyl-CoA. The propionate fermentation was supposed to work as the sink of the reducing power excessively produced in glycolysis; thus while maintaining the redox balance, microorganisms were able to get energy not from polyphosphate but from glycogen. The difference in the metabolic systems between polyphosphate accumulating bacteria and the present microorganisms may give hints to avoid the deterioration of enhanced biological phosphorus removal.

L109 ANSWER 20 OF 23 HCAPLUS COPYRIGHT 2008 ACS on STN

AB Polyhydroxyalkanoates (PHAs) are manufactured from sugarcane sugars, such as byproducts of sucrose or alc. manufacture, by submerged fermentation with Alcaligenes, using a two-stage process. In the 1st stage, bacterial growth is ensured by a medium rich in nutrients. In the 2nd stage, a N-poor medium is supplemented with propionic acid, pentanoic acid, or other precursors of PHAs different from polyhydroxybutyrates. The PHAs are separated and purified using solvents, surfactants and enzymes.

L109 ANSWER 21 OF 23 HCAPLUS COPYRIGHT 2008 ACS on STN

AB A range of Bacillus strains were examined for their ability to accumulate poly-D(-)-3-hydroxyalkanoates (poly-HAKs) which are naturally occurring materials that are optically active, biodegradable thermoplastics. The organisms could produce poly-D(-)-3-hydroxybutyrate (poly-HB) up to 50% of cell dry weight The content of poly-HB in the cells varied with the growth conditions. The addition of propionate or valerate in the culture resulted in a synthesis of poly-D(-)-3-hydroxyvalerate (poly-HV). All the strains tested had the ability to synthesize the co-polyester poly-HB-co-HV.

L109 ANSWER 22 OF 23 HCAPLUS COPYRIGHT 2008 ACS on STN DUPLICATE 14

AB The kinetics of $PhCO_2^-$ degradation by Syntrophus buswellii grown in coculture with Desulfovibrio strain G-11 was determined At low $PhCO_2^-$ concns. the rate of degradation deviated from that predicted by a 1st-order decay process and reached a threshold of 2 - 3 μM $PhCO_2$. S. buswellii was adapted to grow with crotonate and expts. are in progress to isolate this bacterium. An anaerobic bacterium was isolated that catalyzed the cleavage of an aryl ether bond of phenoxyacetate and its chlorinated derivs. forming the resp. phenol. The anaerobic fatty acid-degrading bacterium, Syntrophomonas wolfei, catalyzed a rapid HCO_2^--HCO_3^- exchange reaction and slowly degraded HCO_2^-. Enzymic studies showed that the levels of hydrogenase in cell-free exts. of S. wolfei grown in pure culture or in coculture with Methanospirillum hungatei contained very high specific activities of hydrogenase. HCO_2^- dehydrogenase activity was present, but the activity was 700 - 900-fold less than hydrogenase activity. S wolfei Was adapted to grow with mono- and di-unsatd. fatty acids 5 - 6 carbons in length. Anal. of the fermentation products showed that part of the substrate was β-oxidized while remainder was reduced to the corresponding saturated fatty acid. Propionate was produced from a hexadienoate suggesting that another pathway in addition to β-oxidation exists for the degradation of this compound Labeling studies and anal. of the monomeric composition of poly-β-hydroxyalkanoate (PHA) in S. wolfei showed that early in growth PHA was made by the incorporation of an intermediate without cleavage of a C-C bond. Later, PHA was made by a pathway in equilibrium with the OAc^- pool.

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AB The Leuckart-Wallach reaction with aliphatic aldehydes and secondary amines is initiated at a generally lower temperature than in the case of ketones and aromatic aldehydes and generally gives good yields of products. A possible explanation is the involvement of the H on the α-C atom of the aldehyde through an enamine intermediate. The following compds. were used: Aldehydes, EtCHO (I), PrCHO (II), iso-PrCHO (III), $C_6H_{13}CHO$ (IV), BuEtCHCHO (V), $Me_3CCH_2CHMeCH_2CHO$ (VI); ketones, cyclohexanone (VII), PhAc (VIII); amines, morpholine (IX), piperidine (X), Me_2NH (XI), $(iso-Pr)_2NH$ (XII), $(HOC_2H_4)_2NH$ (XIII), $MeNHC_9H_{19}$ (XIV), and PhNHMe (XV). The enamines were prepared by the method of Mannich and Davidsen (C.A. 30, 8217.2), with anhydrous K_2CO_3 or CaO as catalyst and temps. of 5-50°; the intermediate diimine was converted to the enamine by distillation One mol. of the enamine is treated dropwise with 1-1.1 mols. 98% HCO_2H, heated 1-2 h. at 50-70° (occasionally at 90°), poured into dilute HCl, extracted with ether, made basic with NaOH, and again extracted with ether. Enamines, Satd amine; Aldehyde, Amine, Yield, %, B.p., °C., Mm., Yield, %, B.p., °C., Mm.; II, IX, 95, 105-10, 20, 54, 94-9, 25; III, IX, 29, 89-93, 20, 73, 80-5, 20; IV, IX, 76, 91-4, 2, 32, 90-5, 2; IV, X, 60, 111-12, 3, 84, 78-82, 1; V, IX, 41, 95-115, 1, 60, 81, 0.7; VI, XI, 42, 46-50, 1, 80, 46, 1.5; VI, XII, 23, 79-81, 2, 62, 98-100, 4; VI, IX, 79, 107-10, 3, 85, 81-3, 2; VI, XIII, 52, 105-10, 0.7, 84, 147-50, 1.3; VI, XIV, 70, 117-21, 1, 57, 124-33, 1.5; In carrying out the Leuckart-Wallach alkylations, 1 mol. of the amine was added to 1 mol. HCO_2H, the temperature raised to 60°, and the aldehyde added dropwise (1 h.); the mixture was then heated about 1 h. on. the steam bath; for I and II, the amine-HCO_2H ratio was 1:2. The following reactions are reported: Aldehyde, Amine, Yield, %, B.p., °C., Mm.; I, IX, 5, 78-82, 35; II, XI, 60, 94-6, 760; II, IX, 34, 95-8, 22; III, XI, 59, 70-6, 760; III, IX, 57, 80-4, 15; IV, IX, 46, 76-87, 1; V, XI, 60, 88-90, 20; VI, XI, 84, 52-5, 3; VI, XII, 47, 85-8, 2; VI, XIV, 54, 115-21, 1.5; VI, XV, 17, 117-40, 1.7; VII, X, 25, 113-15, 18; VIII, X, 0, -, -;

=> log y

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